KLAMATH NATIONAL FOREST
Management Indicator Species (MIS) Project Level Assessment Part II of II
Effects of Project on MIS Habitats

PROJECT NAME: Lover's Canyon Project

RANGER DISTRICT: Salmon/Scott River Ranger District

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I. INTRODUCTION

The purpose of this assessment is to evaluate landscape and project-level impacts to habitat conditions associated with the six Species Associations and related Management Indicator Species (MIS) identified in the Klamath Land and Resource Management Plan (Forest Plan 1995) on pages 4-30 through 4-32.

Project Location Information

For a map of the proposed project area and a detailed description of the location, refer to the Craggy Vegetation Management Project file.

II. Forest Plan Species Associations and MIS Selected for the Lover's Canyon Project

Project Level Assessment Checklist

A review was conducted using the Project Level Assessment Checklist to determine: 1) if the project is within the range of any MIS, 2) if habitat for which the species is an indicator is present within the proposed project area, and 3) if there are potential direct, indirect, or cumulative effects on habitat components. Species associations and MIS associated with habitats that may be affected by the project will be analyzed below.

The following species associations and MIS were selected for analysis for the Lover's Canyon Project due to the presence of suitable habitat that may be impacted by the project:

Hardwood Species Associations
- *Acorn woodpecker*
- *Western gray squirrel*

River/Stream Species Association
- *Rainbow trout*
- *Steelhead*
- *Tailed frog*
- *American dipper*
- *Northern water shrew*
- *Long-tailed vole*

Snag Species Association

Red-breasted sapsucker
Hairy woodpecker
White-headed woodpecker
Vaux's swift
Downy woodpecker
Pileated woodpecker
Black-backed woodpecker

The following associations and species were not selected for further analysis due to absence of habitat or because the project will not directly or indirectly affect the habitat (refer to Part I, the checklist, for rationale):

River/Stream Species Association

Cascade frog

Marsh/Lake/Pond Species Association

Northern red-legged frog

Grassland/Shrub-Steppe Species Association

Pronghorn
Montane vole
Loggerhead shrike
Swainson's hawk
Sage thrasher
Burrowing owl

Mature Ponderosa Pine Species Association

Flammulated owl
White-headed woodpecker
Pinyon jay

III. DESCRIPTION OF THE PROPOSED ACTION AND PROJECT AREA

Alternative 1

Alternative 1 is the continuation of the current level of management and use. There will be no project-related treatment with this alternative. Alternative 1 (taking no action) provides reviewers a baseline to compare the environmental effects of the action alternatives.

Alternative 2

The Forest proposes to use a combination of silvicultural prescriptions and fuels treatments to bring the project area to meet the purpose and need. The silvicultural prescriptions include commercial and non-commercial harvests for forest health and fuels reduction. Fuels treatments include wildland urban interface fuels treatments, strategic ridgeline fuel breaks, roadside fuel breaks, and prescribed burning.

The Forest Service proposes this alternative to meet the purpose and need. The proposed action will treat approximately 4,680 acres within the 11,810 acre project boundary. Acres by treatment type are described below and do not account for the overlap in treatment types. Riparian Reserves within and adjacent to treatments units were evaluated on a site-by-site basis for treatment, and will include equipment and treatment exclusion zones as described in the project design features.

Treatments would include commercial thinning on up to 884 acres; non-commercial thinning on up to

1,317 acres; fuels treatments on up to 255 acres; removal of hazard trees along National Forest System roads, county roads, campgrounds, and other high use recreation areas within the project boundary; and prescribed burning on up to 2,223 acres. The time frame for implementation of all aspects of this project is estimated to take about 10 years.

Silvicultural Prescriptions

Thinning prescriptions will be developed on a stand-by-stand basis to meet the objectives of the purpose and need. However, in general the prescription will be a variable density thinning from below, focusing on stands in the small conifer structural class. Of the stands selected for potential treatment, more than half are existing plantations (about 1,700 acres). The remaining area is made up of previously managed natural stands. The Forest is proposing to accomplish these treatments through hand and mechanical thinning with ground-based and skyline logging systems, while hand piling, lop and scattering, biomass harvesting, or mastication is proposed in existing plantations. Activity fuels within harvest units will be hand piled, landing piled, and made available for biomass or permitted public fuelwood collection prior to burning.

Commercial Treatment, Natural Stands (previously managed) (about 716 acres):

The stands would be thinned from below to an SDI of less than 220 followed by treatment of all existing and activity created fuels. See the Fuels Resource Report for more specific fuels treatment information. Scattered, larger, dominant Douglas-fir, ponderosa pine and sugar pine will be cultured throughout the stands by removing surrounding trees that are competing for sunlight, moisture and soil nutrients. Canopy cover would range from 40 to 60 percent. The greater canopy cover is desired where it currently exists and is comprised of the larger, thriftier trees in order to: maintain higher fuel moistures in surface fuels, reduce understory brush establishment and growth, and reduce fuels treatment maintenance costs, intervals and intensities. The pine species and Douglas-fir would be favored. Individual trees that have had stressors removed or reduced will be more resistant and resilient to climate changes (Joyce et al. 2009).

Commercial Treatment, Plantations (about 169 acres):

The stands would be thinned from below, at variable spacing. Trees in the smaller size classes would most frequently be removed. Scattered, larger, dominant ponderosa pine, incense cedar, sugar pine or Douglas-fir found singly or in groups will generally be retained and in some instances cultured by removing trees that are competing for sunlight, moisture and soil nutrients. The large tree culturing will: increase its resistance to insect attack; retain for a longer period of time more of the trees live crown; in some instances increase the growth rate of the tree. This culturing will create small gaps in the canopy of the stand. Hardwoods where they exist will be retained and their growth encouraged by thinning around them. Portions of the stands have a fair component of conifers less than ten inches in diameter. Where no larger, nearby conifers (greater than ten inches in diameter) exist, these thickets would be pre-commercially thinned. In areas where there are healthy, vigorous trees nearby, these smaller stems would be removed. In stands where offsite stock was planted retaining naturally regenerated conifers will be chosen for

retention and wider spacing incorporated to retain those trees that have the potential to achieve the desired sizes for late successional old growth stands.

Pre-Commercial Thin, Plantations (about 1,317 acres):

Plantations established in the 1980's and 1990's would be pre-commercially thinned. In areas where there are healthy, vigorous trees nearby, these smaller stems would be removed. Target Stand Density Index would remain below 230 to preclude inter-tree competition induced mortality. The incidence of disease would be low. Hardwoods would be encouraged. A variety of methods to treat the fuels generated including whole tree yarding, hand piling and pile burning or underburning. In stands where offsite stock was planted retaining naturally regenerated conifers will be chosen for retention and wider spacing incorporated to retain those trees that have the potential to achieve the desired sizes for late successional old growth stands.

Pre-commercial thinning improves forage, forest health conditions, and reduces fuels. Many stands currently have a young component of overstocked trees that are growing and developing slowly due to inter-tree competition. Thinning these areas will increase growth to provide for larger trees in a shorter period of time. Spacing will be somewhat variable depending on species, aspect, site quality, and slope position. The ground and ladder fuels cut are less than 12 inches in diameter and will be treated through one of the methods listed below:

- Mechanical mastication (about 335 acres)

Remaining acres of pre-commercial thin units will be a combination of (about 982 acres):

- Lop and scatter
- Hand thinning and piling (follow-up pile burn)
- Removal to a designated disposal area for burning or chipping

Weeding and cleaning of understory trees is similar to pre-commercial thinning but there is no implied spacing and pertains more to scattered individuals and clumps of understory trees that are not healthy and thrifty. It involves the removal of small (three to ten inch dbh) trees of poor vigor and form, or diseased trees that will not develop into a larger healthy tree in the future. Also, small trees of less desired species will be removed. It is not a technique to eliminate disease within a stand; rather, to lessen its impacts. This treatment removes small trees from an already disease-infected stand, reducing the number of trees getting infected, and concentrating growth on the remaining trees in the stand. Ladder fuels are also reduced.

Treatment of Activity Generated Fuels:

Where treatments do not overlap with proposed prescribed burn activities the activity generated fuel will be treated by variety of methods including whole tree yarding, hand piling and pile burning, or underburning.

Connected Actions:

As the project is proposing to enter previously managed stands, no new road construction is proposed. Existing National Forest Transportation System roads, existing roadbeds, and temporary roads will be used for project implementation. Existing roadbeds will also be used for temporary access where available, and then will be closed and hydrologically stabilized following unit treatments. No new temporary access roads will be created outside of harvest units. An estimated 10 segments of temporary road will be used totaling 1.15 miles; of that about 1.05 miles are on existing roadbeds.

The majority of skyline will be yarded to "continuous" landings, which are widened areas of existing road bed sufficient to facilitate operation of cable yarders and swing loaders. This project will utilize about 63 landings for ground based operations, ranging in size from one quarter to one acre in size. There will be about 19 new landings constructed. The remaining 44 landings will be on existing sites. New landings will not be constructed in Riparian Reserves.

Fuels Treatments (about 2,478 acres)

In addition to commercial harvest, pre-commercial thinning, and roadside hazard treatments described in this proposed action, hazardous fuel treatments will further reduce the dangers associated with heavy fuel loading, especially within the wildland urban interface. Hazardous fuels treatments may occur in Riparian Reserves. These treatments were developed using the criteria listed below and include: lop and scattering, chipping, mastication, broadcast burning, jackpot burning, and thinning and pilling with follow-up pile burning.

Criteria:

- Confined to areas determined to be feasible in terms of slope, accessibility, existing fuels conditions, and logical holding features such as roads, streams, and ridges.
- Focus on treatments within 0.25 mile from private property.
- Focus on protecting infrastructure including but not limited to utility lines, communication sites, campgrounds, and bridges.
- Treatment would occur within 250 feet on either side of strategic Forest roads and ridgelines.

Information on how each fuels treatment will be implemented is described in detail below. These descriptions are categorized based on type of treatment or the location within the project area. Description of treatments within the wildland urban interface, fuel breaks (roadside and ridgeline), and in areas proposed for prescribed burning are provided below.

<u>Wildland Urban Interface (about 158 acres):</u>

A combination of mechanical, mastication, and hand work is proposed within the wildland urban interface areas of the project. Areas identified for treatment with mechanical equipment will include a combination of cutting trees and other understory vegetation. After mechanical or mastication treatments, activity generated slash will be piled and burned. Areas treated only by hand thinning will remove dead vegetation or trees under 12 inches in diameter and will be disposed of by chipping, piling with follow-up burning.

Live understory vegetation (less than 12 inches in diameter) will be removed to reduce flame length, intensity, and the potential for crown fire activity. The objective is to have an area with a reduced fuel load and minimized ladder fuels to create a more defensible wildland urban interface during future fire events. Where commercial harvest units and wildland urban interface treatments overlap, commercial harvest will occur first followed by fuels treatments as described above.

Strategic Ridgeline Fuel breaks (about 37 acres):

There is one ridgeline treatment planned that is parallel to forest road 44N55 from Box Camp saddle down to private property, approximately one mile in length. Treatment in on this strategic ridgeline would remove all dead vegetation and live brush greater than two feet tall, and by thinning live conifer trees less than 12 inches in diameter at breast height to approximately 20-foot spacing. Hardwoods would be retained. Retained conifers will be pruned up to seven feet above the ground within these zones to increase canopy base height, and reduce ladder fuels and the potential for crown fire initiation. Activity generated fuels will be treated by a variety of methods. Where hand thinning is proposed, lopping and scattering of fuels, piling and burning, and/or chipping will be used to reduce fuels. Mechanical or mastication equipment may be used to pile activity fuels within these areas in addition to, or in lieu of hand work. This treatment type is not occurring within nesting/roosting habitat for the northern spotted owl.

Roadside Fuels Treatments (about 60 acres):

Treatments along strategic roads will help to hold a planned or unplanned fire within the project area. Roadside treatments that were identified as strategic road systems for ingress/egress in accordance with the Lower Scott River Fire Safe Council Community Wildfire Protection Plan (2007) will include removal of activity generated fuels to provide access for fire suppression resources responding to future unplanned ignitions. Treatments would decrease ladder fuels, break up the continuity of fuels over the large landscape, provide areas of reduced fuels surrounding patches of suitable northern spotted owl habitat, and provide anchor points for future fuels treatments (such as surrounding prescribed fire). Roadside fuels treatments will vary in size and depth depending on fuel arrangements but generally will include thinning (non-commercial), hand piling, hazard tree removal, and pile burning along a maximum 250 foot buffer on both sides of the road. Widths of the roadside treatments will be variable and could be as little as 50 feet wide in some areas where fuels are light. Treatments within the treatment buffer will not be uniform and are expected to continue to provide high vegetative diversity after treatment. Hazard trees will be removed; small diameter conifers (less than 10 inches dbh) and ladder fuels will be cut and piled and follow up burning will occur. Where there is overlap between roadside fuels treatments and commercial harvest units more canopy modification will occur as part of the thinning prescription for that unit.

Where roadside fuels treatments overlap with northern spotted owl nesting/roosting habitat the following treatment restrictions will be followed:

- Roadside fuels treatments will be within 200 feet on either side of the road.

- Only conifers less than 6 inches dbh will be thinned and to a 20 foot or less spacing.
- Retain all hardwoods
- In order to maintain a mosaic of habitat types after treatment there will be patches of untreated understory.
- Trees that contribute to overstory canopy will not be removed, unless it meets the definition of a hazard tree.
- A limited operating period will apply between February 1 and July 9 for thinning, hand piling, and burning of piles.

Prescribed Burn (about 2,223 acres):

Prescribed burning is proposed under weather conditions which promote low-intensity fires. Generally, fuels treatments will be implemented within three to five years after silviculture treatments have been implemented. There is no expected change in canopy closure beyond five percent after implementation. A mosaic post-burn condition will result from prescribed burning with isolated pockets of tree mortality, and burned and unburned understory vegetation. A mosaic burn is anticipated where some areas fully consume surface fuels and other areas are partially burned or unburned. These treatments will re-introduce fire to the project area under prescribed conditions that will reduce stands down toward low to mixed-severity fire conditions. Benefits of these actions include fuels reduction and vegetation diversity. Some nesting and roosting habitat does occur within proposed under burn areas. The objective for these blocks is to help reduce the chance of negative effects of unplanned ignitions and to maintain late-successional conditions. Under burning is proposed in 390 acres of silvicultural stands where these stands overlap with the planned burn blocks, this will treat pre- and post-harvest fuels. These areas were also designed to work synergistically with the silviculture treatments and fuel breaks proposed. In the case of overlapping treatments, prescribed burning will be the last treatment to be implemented. As a result of burning there will be no more than a five percent loss of total crown closure in suitable northern spotted owl habitat overall. Effects of mosaic burns may result in small openings created from crown burned individual trees or small groups of trees less than 12 inches. Crown closure of stands will not go below 60 percent in northern spotted owl nesting and roosting habitat or 40 percent in northern spotted owl foraging habitat (this includes hardwood, subdominant, and dominant tree component over 15 feet).

Second entry burns in units identified for prescribed burning will be used to maintain surface fuel loading and increase heterogeneity of forest structure and vegetation by consuming surface fuels and small understory vegetation. Many of the prescribed burning locations will use existing control lines established in recent large fires within the project area. Fire lines will be constructed around the perimeter of the prescribed burn and will include using dozers to re-scrape control lines to mineral soil. Natural barriers to fire such as rock outcrops or talus would be used where they exist. In areas where control lines are not accessible by equipment, hand-line construction to mineral soil will occur. Removal of understory

vegetation along control lines will include cutting brush and conifer trees less than 12 inches in diameter to facilitate holding operations during prescribed fire implementation.

Alternative 3

This Alternative was developed in response to relevant issue 3 (section 1.7 of the environmental assessment) to address the concern regarding effects to areas identified as high value habitat for the northern spotted owl within the project area. Treatments in alternative 3 are identical to Alternative 2 with the exception of the differences described below and listed in Table 7 of section 2.5 of the environmental assessment.

- For commercial treatment units that were identified as high value, the silvicultural prescription was altered as follows (630 acres of commercial treatment).
  - Increase the percent of skip areas to 25 percent (Alternative 2 incorporated 15 percent skip areas into the prescription).
  - Increase the potential size of skips to two acres in size (Alternative 2 had a maximum area of one acre for skips).

Increasing the percent and size of skip areas into the silvicultural prescriptions is expected to leave a higher level of structural diversity immediately post-treatment reducing the short-term effects to northern spotted owl habitat that is identified as high value. The focus of this alternative is on protecting higher value (more recently occupied) habitat while aiming to achieve long-term beneficial effects in areas that are not currently occupied to improve future site quality. This alternative was developed in accordance of Recovery Action 10 of the Revised Recovery Plan for the Northern Spotted Owl (2011) which recommends the conservation of spotted owl sites and high value spotted owl habitat to provide additional demographic support to the spotted owl population. This alternative reduces the intensity of treatment in locations identified as high value for the northern spotted owl from what was proposed in Alternative 2 and meets Recovery Action 10 in the Revised Recovery Plan.

IV. MIS ENVIRONMENTAL BASELINE AND EFFECTS OF THE PROJECT

Information on species natural history, including general habitat requirements, is found in the “Species Natural History Summary for MIS” found in the project file. Rationale for designation of MIS is found in the EIS for the Forest Plan (1995) and on the "Forest Plan MIS Selection Summary" in the project file. The Project area was affected by the wildfires of 2008. Habitats providing snags were not lost in the wildfire. Snag densities were enhanced from what existed in pre-fire condition. The moderate and high intensity burned areas negatively influenced snag recruitment however this project proposes to plant new conifers that will eventually enhance snag recruitment. For the proposed project no measurable change in stand snag suitability is expected due to the low number of snags being removed and Forest-wide standards and guidelines being met for snag and coarse woody debris (CWD) in treated areas. There will be some loss of recruitment trees in the treated areas but snags should remain abundant in untreated areas of the analysis area. Approximately, 1,988 acres (less than four percent) of 45,529 acres will be treated

(thinning and underburn) with this project. Currently, there is an abundance of oak habitat and snags and course woody debris within the forested habitat of the analysis area.

Based on the results of the project changes in the post-damage assessment of the winter 2017 landslides for the Lover's Canyon area, there is no measurable change in Management Indicator Species habitats. New landslides within the project area total about 29 acres of active features. Approximately 15 acres of these landslides overlap with proposed treatment units. The landslides did not remove or downgrade MIS habitat. The changes proposed in the 15 acres of overlap are less than what was originally analyzed in the project MIS analysis.

HARDWOOD SPECIES ASSOCIATION

Acorn woodpecker and Western gray squirrel were selected as indicators for hardwood habitat.

Environmental Baseline

The Lover's Canyon analysis area is dominated with mixed conifer forest with small inclusions of oak hardwood habitats at lower elevations. Hardwoods are found as an understory species in most mixed conifer stands however there are only 548 acres of pure hardwood stands that are found in the entire 26,870 acre analysis area.

Acorn Woodpecker

Environmental Baseline

The analysis area for snag-associated species in the Lover's Canyon Project is the same as the "project area" as described in the environmental assessment. The project area is large enough in size to potentially contain habitat for several acorn woodpecker territories. There are 548 acres of oak habitat potentially suitable for acorn woodpecker.

Effects of the Proposed Project

Alternative 1

There would be no change in the amount or quality of oak habitat in the project area; risk of stand replacing fire would remain moderate to high in the landscape.

Alternative 2

Four acres of potential habitat are located within treatment units. Hardwoods will be retained based on the treatment prescription guidelines. Proposed treatments will not affect the availability of oak habitat.

Proposed harvest and post-harvest activity fuels treatments is not predicted to affect suitable habitat for acorn woodpecker. Oaks could provide habitat components will not be removed. Treatment prescription guidelines will maintain oaks in these treated areas. Outside of treated areas oak habitat will remain throughout the 7th field watersheds.

Alternative 3

Four acres of potential habitat are located within treatment units. Hardwoods will be retained based on the treatment prescription guidelines. Proposed treatments will not affect the availability of oak habitat.

Proposed harvest and post-harvest activity fuels treatments are not predicted to affect suitable habitat for acorn woodpecker. Oaks could provide habitat components will not be removed. Treatment prescription guidelines will maintain oaks in these treated areas. Outside of treated areas oak habitat will remain throughout the 7th field watersheds.

Western Gray Squirrel

Environmental Baseline

The analysis area for snag-associated species in the Lover's Canyon Project is the same as the "project area" as described in the environmental assessment. The project area is large enough in size to potentially contain habitat for several western gray squirrel territories. There are 548 acres of oak habitat potentially suitable for western gray squirrel.

Effects of the Proposed Project

Alternative 1

There would be no change in the amount or quality of oak habitat in the project area; risk of stand-replacing fire would remain moderate to high in the landscape.

Alternative 2

Four acres of potential habitat are located within treatment units. Hardwoods will be retained based on the treatment prescription guidelines. Proposed treatments will not affect the availability of oak habitat.

Proposed harvest and post-harvest activity fuels treatments are not predicted to affect suitable habitat for western gray squirrel. Oaks could provide habitat components will not be removed. Treatment prescription guidelines will maintain oaks in these treated areas. Outside of treated areas oak habitat will remain throughout the 7th field watersheds.

Alternative 3

Four acres of potential habitat are located within treatment units. Hardwoods will be retained based on the treatment prescription guidelines. Proposed treatments will not affect the availability of oak habitat.

Proposed harvest and post-harvest activity fuels treatments are not predicted to affect suitable habitat for western gray squirrel. Oaks could provide habitat components will not be removed. Treatment prescription guidelines will maintain oaks in these treated areas. Outside of treated areas oak habitat will remain throughout the 7th field watersheds.

RIVER/STREAM SPECIES ASSOCIATION

Rainbow trout and steelhead, tailed frog, American dipper, northern water shrew, and long-tailed vole were selected as indicators for water quality (temperature, turbidity), substrate, large woody debris, flows, drainage network, disturbance history/regime, and Riparian Reserves within rivers and streams.

Fish (Rainbow Trout/Steelhead Trout)

Refer to the Lover's Canyon Aquatic Resource Report for direct, indirect, and cumulative effects to these species. The information contained below is a brief summarization of the more thorough aquatic analysis discussed in the Resource Report.

Environmental Baseline

Steelhead/rainbow trout habitat is found in Scott River, Canyon Creek, and Kelsey Creek. Resident rainbow trout are found in Boulder Creek and South Fork Kelsey Creek. Additionally, summer refugia for salmonid fish are identified to be present at the mouth of Boulder Creek, Canyon Creek, and Kelsey Creek. For the project, the area of effect is considered to be fish-occupied perennial systems adjacent and downstream of Project components within the project boundary – approximately 44 miles of habitat total. Actual area of effect may be much smaller, and is dependent upon the Project component under consideration (i.e., drafting will produce effects immediately adjacent to the site, while timber harvest effects will be generalized across a drainage).

Effects of the Proposed Project

Alternative 1

Under this alternative, the Project will not happen and no management actions will be taken. As a result, legacy sites identified for the Lover's Canyon Project will not be addressed.

Legacy sites identified for the Lover's Canyon Project will not be treated. The effect to fish and fish habitat of not addressing these sites could range from not measurable to significant, depending upon the scenario and the species considered. The majority of locations are considered to be "low-risk" or "moderate-risk", whereupon current or potential sediment impact to their respective watershed is minimal. However, there are also multiple "high-risk" sites: the nearest location with elevated risk is about 250 feet from resident rainbow trout habitat, and more than one mile for anadromous habitat. The greatest potential for detrimental impact would occur if a large storm (100-year event or larger) affected the Project area, with the worst-case scenario of all legacy sites failing.

The impact to fish habitat from sediment produced due to failure of legacy sites is unknown. All major streams in the Project area, with the exception of Scott River, are considered to have good baseline water quality. If a single or several sites were to experience catastrophic failure the impact downstream is likely to be minimal and short term. In the event of all sites failing concurrently, the amount of sediment released would be additional to that which would be naturally produced through other means, such as landslides. While there are multiple legacy sites throughout the Project area, most are distant from fish-occupied waters or require extensive overland movement of sediment to reach a waterway. Where sites

are near fish-occupied waters, rainbow trout, particularly those found in South Fork Kelsey Creek, are at greatest risk for habitat alteration due to close proximity. Anadromous habitat is more distant from legacy sites; and while storm-related impacts are likely to occur, it would be difficult to separate sediment originating from natural and anthropogenic sources.

Alternative 2

Indicator for temperature, turbidity, substrate, large woody debris, flows, drainage network, disturbance history/regime, and Riparian Reserves.

Direct – Drafting at fish-occupied sites will occur at five fish-occupied locations within the Project area. One of these sites is within anadromous waters (Canyon Creek), and four sites are associated with resident rainbow trout (Boulder Creek [two]; South Fork Kelsey Creek [two]). As drafting will occur at established, hardened drafting access point, there will be no new construction and, therefore, no alteration of the existing riparian or new delivery of sediment to the system. Possible area of very minor and insignificant impact in the analysis area would be the immediate vicinity of the drafting area when the pump is in operation. As described in Project best management practicess and project design features (resource protection measures), NOAA drafting specifications (NOAA 2001) will be implemented during project water drafting at all sites. Water drafting will also result in slight, temporary decrease in flow, as well as a small sediment plume, both of which are considered insignificant when drafting from larger, perennial system such as those in the Project area. There is a very low probability of impingement because all locations have sufficient room for adult and juveniles to distance themselves from the screens. It is anticipated that fish temporarily avoiding water drafting activities are not likely to experience reduced feeding success, nor result in a significantly higher probability of exposure to predators. When drafting stops, stream flow is returned to pre-draft conditions, so no long-term effects will occur. Water temperature and other water quality elements will not be affected.

Indirect – The elements comprising the Project are varied, and degree of effect to habitat is dependent upon specific action considered and location in regards to fish-occupied waters. Overall, any negative indirect effects to River/Stream habitat indicators will be short-term and temporary.

Temperature – Temperature is not expected to be affected in a biologically meaningful manner by Project activities. Elements with the potential to affect temperature include vegetation treatments within Riparian Reserves which could reduce stream shading and water drafting.

Water drafting results in minor short-term reductions in stream flow during operations. Drafting will follow NOAA specifications and BMPs. Drafting from fish-occupied sites will not have any meaningful impact to temperature due to the relatively large flow volume of the respective streams which would render any changes in flow due to drafting as insignificant to overall stream temperatures, including thermal refugia.

Effective shade in the Project area will not be reduced by the Project due to commercial, silviculture, or prescribed fire activities. Commercial treatments are greater than 170 feet from fish-occupied streams in

all units; and where they are not (Units 526-110), field reviews have confirmed habitat elements, including shading, will be maintained. Smaller buffers are present in the Project area upon non-fish-bearing streams – 15 feet in plantation units and 50 feet in natural stands. Any reduction of shade upon these small headwater streams will be insufficient to affect water temperatures downhill in fish-bearing reaches due to distance and small flow volume. In many cases, these headwater creeks are dry in the summer; and if there is no contribution of surface water to the mainstem tributaries, then there can be no impact to temperatures during this critical time of the year. Similarly, prescribed fire will not impact stream temperature because overstory riparian vegetation is expected to be maintained within Riparian Reserves throughout the Project area.

Turbidity – Only work associated with legacy site repair and water drafting would occur within a stream channel, potentially creating turbidity. The amount of ground disturbance and associated stream turbidity likely as a result of the crossing upgrades is limited in scope and intensity. Legacy site activities which occur in association with stream channels are above habitat occupied by fish, and potential sediment generated from these activities is likely to be undetectable greater than 300 feet downstream of the site and therefore would not have any effect to fish or their habitat. Where drafting sites are within fish-occupied waters, a small plume of suspended sediment is expected during operations, but turbidity will be localized, minimal in extent and duration, with the most likely fish behavior to be one of avoidance. No measurable increase in turbidity expected beyond the immediate area where drafting occurs.

Sediment/Substrate – Ground disturbing actions within the Project area have the potential mobilize fine sediment, thereby affecting bottom substrate composition, although it will not be sufficiently significant to alter existing habitat values. Most sediment which is mobilized by Project activities is expected to remain localized near to the site of disturbance. Because there will be no measurable transport of sediment to fish-occupied areas above the background level, habitat variables which directly or indirectly respond to this metric (turbidity, pool frequency and quality, width/depth ratio, and floodplain connectivity) will not be affected. Furthermore, hydrologic function within the Project area will be maintained: as per cumulative watershed effects (CWE) modeling, no accelerated surface runoff is expected and landslide risk will not be measurably elevated above existing background values. Due to the location of the Project upon the landscape, functionality of Riparian Reserve buffers, project design features, and Best Management Practices considered adequate to control overland movement of sediment, neither fish nor their habitat will be affected by changes to the sediment regime caused by Project activities.

Large Woody Debris – Effect to recruitment and transport of large woody debris of an appropriate size to affect habitat attributes of fish-bearing streams is not expected. Creeks with fish and fish habitat adjacent to harvest units will retain similar rates of current large woody debris recruitment due to buffer width. Where a decreased input of smaller debris may affect function of fishless headwater systems, the impact will be short-term, localized, and unlikely to be noticeable downgradient within fish-occupied reaches. In the long-term, benefits are expected throughout the Project area via the growth of larger trees which may contribute to future large woody debris input.

Disturbance History/Regime –The ERA, USLE, and GEO models track various aspects of human and natural impacts upon the landscape and geologic environment. ERA ("Equivalent Roaded Area") provides an accounting system for tracking disturbances that affect watershed processes, in particular changes in peak runoff flows influenced by ground disturbing activities; USLE ("Universal Soil Loss Equation") tracks surface erosion and sediment delivery in the first year following project completion; and GEO estimates sediment delivery from mass wasting (e.g., landslide events) for the first decade after project completion. A threshold of "1" generally indicates an elevated risk of impact from a given model, and the point where departure from natural background variation may begin to be discerned.

For the Project, one or more disturbance indices will increase in all watersheds as a result of implementation. While there are CWE model increases as a result of this Project, there will be no significant effects to aquatic habitat from any Project activities. Model estimates for ERA and USLE remain below the critical threshold for all drainages; and while the Deep Creek-Scott River 7th field watershed has a pre-project elevated GEO rating risk, the Project will not appreciably increase the existing risk (1.37 to 1.40). Estimates for the GEO model in other watersheds remain below threshold. Therefore, the Project will experience no functional change in disturbance indices and there will be no measurable effect to fish habitat.

Peak/Base Flows – At the site level, there is potential for short-term, indirect effects downstream from water drafting locations. However, NOAA drafting specifications and BMPs guide operations to minimize effect of water withdrawal on aquatic habitats. Therefore, effects of water drafting are considered insignificantly small in regards to fish habitat due to resource protection measures (project design features) and best management practices (BMP), short duration, and size of the creeks being utilized.

There will be no watershed-scale changes to peak/base flows as a result of Project activities due to treatment unit location on the landscape, minimal and localized impacts, and functioning buffering capacity of intervening Riparian Reserve habitat. This is reflected in ERA model output, which remains below the threshold of concern.

Drainage Network – The drainage network can be roughly considered in light of road density, number of road crossings, and overall ERA, but primarily it is an aspect of how "connected" a drainage feature (road, ditch, or other element) is to the natural hydrologic system. The Project will not alter the miles of roads upon the landscape. Temporary roads will be placed upon existing roadbeds, which will minimize increases in drainage network from this Project component; and the amount of new roadbed to be constructed to access landings is very small (less than 400 feet). However, the construction or reoccupation of landings and skid trails will create a temporary increase in local drainage network. Resource protection measures will ensure that drainage impacts from landings and skid trails are short-term and localized. This is because skid trails will not cross perennial streams, and intermittent streams will only be crossed while dry and at pre-approved locations. In the long-term, there will be no increase in the drainage network because landings and skid trails will be rehabilitated. Conversely, temporary roads

will be hydrologically stabilized (e.g., pull culverts; outslope road prisms, if appropriate; obliterate accesses) and legacy sites associated with creek crossings will corrected. These latter actions are expected to insignificantly decrease human-caused increases in the drainage network, thereby creating a slightly better post-Project hydrologic condition compared to pre-Project.

Riparian Reserves – Project activities will have both a short-term and a long-term effect to Riparian Reserves. In the short-term, individual components which comprise the Riparian Reserve variable will impart insignificant, mostly localized, effects which will not alter the functional level of the Riparian Reserve in the Project area. For instance, at the site level, water drafting will use existing accesses. Brushing, grading, and rocking of approaches will have effects to Riparian Reserves that remain confined to road prisms and immediately adjacent vegetation. In the very long-term, harvest and silviculture treatments are expected to provide a landscape-scale benefit to Riparian Reserves in the form of larger trees and increased size of in-stream wood. However, this positive may be offset by prescribed fuels treatments which are insufficiently aggressive to fundamentally modify the existing riparian condition of altered fire regime. Therefore, it is the professional judgment of the Fish Biologist that the long-term effects to Riparian Reserves is neutral.

Overall, individual steelhead or rainbow trout may be affected and there may be some short-term, insignificant impacts to habitat. Except for an insignificant benefit via a decrease in (human-created) drainage network, no long-term effects to fish or their habitat are expected.

Cumulative Effects - There will be minimal cumulative impacts to aquatics from current and reasonably future foreseeable projects within the vicinity of the Lover's Canyon Project. Cumulative impact occurs when the effects of one project overlaps with or compound the effects of another. In the Lover's Canyon Project area, although other projects may overlap Project boundaries and/or share a common watershed without physical boundary overlap, there will be no significant adverse additive effects to fish or aquatic habitat. Cumulative Watershed Effects models either remain below the threshold of concern, else are not exasperated, when the effects of Alternative 2 and all current and future foreseeable projects are included in the model.

Alternative 3

Direct and Indirect – Alternative 3 differs from Alternative 2 in regards to magnitude of impact.

Adjustment of treatments within commercial units to create larger skip areas to leave a higher level of structural diversity post-treatment will not measurably affect fisheries resources. The majority of units affected by this alternative are located upslope and distant from fish-bearing streams. For the units adjacent to fish-occupied water, treatment adjustments within Riparian Reserves, if they occur, will be situated at least 170 feet from the creek. Furthermore, there will be no changes to the post-Project cumulative watershed effects because prescription modifications are of insufficient size and intensity to be modeled on the landscape level. Because of these reasons, a measurable benefit to aquatic resources, and thus change to analysis described for Alternative 2, is not expected.

The direct and indirect effects for all connected actions – landings, temporary roads, water drafting, and repair of legacy sites – will remain the same as Alternative 2.

Cumulative – Cumulative effects will be the same as described under the Alternative 2.

Frogs (Tailed frog)

Indicator for temperature, turbidity, substrate, large woody debris, flows, drainage network, disturbance history/regime, and Riparian Reserves.

Environmental Baseline

Tailed frogs may occur in the 30 miles of intermittent and 52 miles of perennial streams within and immediately adjacent to the project area. Incidental sightings have reported this frog to be present in the South Fork Kelsey Creek drainage. While it is likely that this species is present elsewhere in the Project area, no surveys have been conducted. This frog species is expected to occur in suitable habitat within the Project area.

Effects of the Proposed Project

Alternative 1

Under this alternative, the Project will not happen and no management actions will be taken. As a result, legacy sites identified for the Lover's Canyon Project will not be addressed. The effect to tailed frogs and their habitat of not repairing legacy sites would be largely as described for steelhead/rainbow trout. Because frogs could be present on intermittent streams where fish are not, this species is potentially at higher risk due to greater exposure and closer proximity to legacy sites.

Alternative 2

Direct – Drafting at sites potentially occupied by frogs will occur at eight locations within the Project area – Boulder Creek (2 sites), Canyon Creek (1 site), SF Kelsey Creek (2 sites), Second Valley Creek (1 site), Canyon Creek Trib #1 (along Road 43N45), and Canyon Creek Trib #2 (along Road 44N45). As drafting will occur at established access points, there will be no new construction and, therefore, no alteration of the existing riparian or new delivery of sediment to the system. Possible area of very minor and insignificant impact in the analysis area would be the immediate vicinity of the drafting area when the pump is in operation. At fish-occupied locations, fish screens are required and NOAA drafting specifications and other Project BMPs limit drafting rates. While screens are not required at the three non-fish-occupied sites, drafting rates are still restricted by BMPs to less than 350 gpm or less than 50% of the surface flow (whichever is less); and drafting ceases once bypass flow drops below 10 gpm. Water drafting will also result in slight, temporary decrease in flow, as well as a small sediment plume, both of which are considered insignificant. When drafting stops, stream flow is returned to pre-draft conditions, so no long-term effects will occur. Water temperature and other water quality elements will not be affected.

Indirect – The elements comprising the Project are varied, and degree of effect to habitat is dependent upon specific action considered and location in regards to frog-occupied waters. Overall, any negative indirect effects to River/Stream habitat indicators will be short-term and temporary.

Temperature – Temperature will be as described for steelhead/rainbow trout. There is the potential for frogs to be present in perennial/intermittent channels adjacent to and within Project units. However, as effective shade within the Project area is not expected to be measurably reduced by Project activities, any impacts to temperature will be insignificant and will not affect frogs.

Turbidity – Turbidity is primarily expected to increase during in-channel activities associated with drafting and legacy site repair. The potential effect of water drafting is as described for steelhead/rainbow trout, but would be applicable to all drafting locations, not just those occupied by fish. Of the 53 legacy sites, only 14 are directly associated with perennial or intermittent channels. If the legacy sites undergo repair while their respective channels are wet, a sediment plume during would be expected, and for a short time afterwards as the sites settle. However, most legacy sites are expected to be fixed while the channel is dry, and such is not expected. The effect to frogs downstream (within 300 feet) of any sediment plume will be temporary and not biologically meaningful. Frogs outside the 300 foot distance will not be affected. Increased turbidity will happen only when in-channel activities are occurring.

Sediment/Substrate – Ground disturbing actions within the Project area have the potential mobilize fine sediment, thereby affecting bottom substrate composition, although it will not be sufficiently significant to alter existing habitat values. In general, substrate as described for steelhead/rainbow trout also applies to frogs. However, frogs have the potential to be present in portions of the Project area not accessible to fish, and therefore may experience an increased exposure to fine sediment. The Hydrology Resource Report reported an expectation that sediment produced from Project activities could have a localized, short-term effect to water resources. The effect would be limited to the site scale (i.e., at or near the treatment area and less than 100 meters [about 330 feet] downstream) and be present for less than one year. Furthermore, hydrologic function within the Project area will be maintained: as per CWE modeling, no accelerated surface runoff is expected and landslide risk will not be measurably elevated above existing background values. Even if fine sediment is mobilized, the use of RMP/BMPs minimize the amount such that substrate composition is not expected to measurably change. Therefore, the risk associated with fine sediment to frog and frog habitat is insignificant.

Large Woody Debris – Effect to recruitment and transport of large woody debris of an appropriate size to significantly affect habitat attributes of systems supportive of frog habitat is not expected. Larger creeks – i.e., those capable of bearing fish – which are adjacent to harvest units will retain similar rates of current large woody debris recruitment due to buffer width. Conversely, there is the potential for decreased input of smaller debris affecting the function of fishless headwater systems where commercial or non-commercial activities occur less than one tree-height from the channel. Unlike larger streams, small wood (i.e., branches and tree tops) in headwater systems can affect habitat, providing functions such as sediment storage and habitat for invertebrates. However, the impact is expected to be short-term and

localized to those relatively few units which cross or are immediately adjacent to small headwater streams. Instream habitat values will return to baseline as trees grow. In the long-term, benefits are expected throughout the Project area via the growth of larger trees which may contribute to future woody debris input.

Disturbance History/Regime – The disturbance indices will be as described for steelhead/rainbow trout. The Project will experience no functional change in CWE models and therefore there will be no measurable effect to frog habitat.

Peak/Base Flows – Alterations in peak/base flows will be as described for steelhead/rainbow trout. At the watershed-scale, changes to flows by Project activities will not occur. Drafting will occur at sites potentially occupied by frogs. Whereas changes in flows upon the fish-occupied sites will not be measurably affected, three locales are located within relatively small systems and drafting may result in localized decreases in flow downstream. However, BMPs guide drafting operations, including provisions such as the drafting rate should not exceed 50 percent of the surface flow and that drafting will cease once bypass flows drop below 10 gallons per minute. Frogs downstream of the three non-fish-occupied sites may experience temporary decreases in flows while drafting is happening, but the channel will not go dry. When drafting stops, stream flow is returned to pre-draft conditions, so no long-term effects will occur.

Drainage Network – The drainage network will be as described for steelhead/rainbow trout. While there may be some short-term increases in the drainage network associated with landings, skid trails, and temporary roads, in the long-term there will be a slight decrease due to hydrologic stabilization and legacy site repair.

Riparian Reserves – Impacts to the Riparian Reserve will be as described for steelhead/rainbow trout. Resource protection measures will ensure Riparian Reserve character will not be detrimentally altered by commercial harvest, silviculture treatments, or prescribed fire activities. Water drafting may have insignificantly small localized effects due to brushing and access maintenance, but there will be no effect to the functional level of the Riparian Reserve. In the very long-term, harvest and silviculture treatments are expected to provide a landscape-scale benefit to Riparian Reserves in the form of larger trees and increased size of in-stream wood. However, this positive may be offset by prescribed fuels treatments which are insufficiently aggressive to fundamentally modify the existing riparian condition of altered fire regime. Therefore, it is the professional judgment of the Fish Biologist that the long-term effect to Riparian Reserves is neutral.

Overall, individual tailed frogs may be affected and there may be some short-term, insignificant impacts to habitat. Except for an insignificant benefit via a decrease in (human-created) drainage network, no long-term effects to frogs or their habitat are expected.

Cumulative Effects - There will be minimal cumulative impacts to aquatics from current and reasonably future foreseeable projects within the vicinity of the Lover's Canyon Project. Cumulative impact occurs when the effects of one project overlaps with or compound the effects of another. In the Lover's Canyon Project area, although other projects may overlap Project boundaries and/or share a common watershed

without physical boundary overlap, there will be no significant adverse additive effects to tailed frog or their habitat. Cumulative Watershed Effects models either remain below the threshold of concern, else are not exasperated, when the effects of Alternative 2 and all current and future foreseeable projects are included in the model.

Alternative 3

Direct and Indirect – Alternative 3 differs from Alternative 2 in regards to magnitude of impact.

Adjustment of treatments within commercial units to create larger skip areas to leave a higher level of structural diversity post-treatment will not measurably affect tailed frog or their habitat. Only 12 commercial units which have potential frog habitat (i.e., intermittent/perennial streams) within/adjacent to their boundaries are affected by the harvest prescription alteration. Only if treatment adjustments occur within Riparian Reserves could lesser site-level impacts to temperature, large woody debris, and Riparian Reserve character be affected, compared to Alternative 2. However, if treatment adjustments occur elsewhere in the unit, then Project effects will be as described previously. Overall, the difference in magnitude of impact to Riparian Reserve and large woody debris between Alternative 2 and Alternative 3 is very slight, and is unlikely to measurably affect tailed frog habitat. The other variables under discussion – turbidity, sediment/substrate, disturbance history/regime, peak/base flows, and drainage network – will not be altered under the proposed prescription adjustment. Specifically, there will be no changes to the post-Project cumulative watershed effects because prescription modifications are of insufficient size and intensity to be modeled on the landscape level.

The direct and indirect effects for all connected actions – landings, temporary roads, water drafting, and repair of legacy sites – will remain the same as Alternative 2.

Cumulative – Cumulative effects will be the same as described under Alternative 2

American Dipper, Long tailed Vole, Western Pond Turtle, and Northern Water Shrew

American dipper - Indicator for temperature, turbidity, substrate, large woody debris, flows, drainage network, disturbance history/regime, and Riparian Reserves.

Long-tailed vole – Indicator of riparian vegetation including canopy, deciduous vegetation, and grass/forb.

Northern water shrew – Indicator of riparian vegetation including canopy, deciduous vegetation, and grass/forb.

Western pond turtle – Permanent or nearly permanent water in a variety of habitats.

Environmental Baseline

American dippers, long-tailed vole, and northern water shrew are expected throughout the project area wherever running water occurs (26 miles of perennial and 27 miles of intermittent streams). Western pond

turtle are expected to potentially occur along eight miles of lower gradient stream habitat along the North Fork of the Salmon River.

Effects of the Proposed Project

Alternative 1

Under this alternative, the Lover's Canyon Project proposed actions will not occur, and thus there will be neither ground disturbance nor water diversion/drafting. Water quality parameters (such as stream temperatures, nutrients, turbidity, etc.) and substrate (e.g., sediment fines within gravels, pools, etc.) will therefore be unaltered from current conditions.

Alternative 2

Direct and Indirect Effects – Drafting at sites potentially occupied by the American dipper, long-tailed vole, western pond turtle, and northern water shrew will occur at four locations within the project area – NF Salmon River (2 sites), Lover's Canyon ups Gulch (an unnamed tributary), and Jones Gulch (an unnamed tributary). As drafting will occur at established access points, there will be no new construction and, therefore, no alteration of the existing riparian or new delivery of sediment to the system. There may some disturbance to these species during the drafting however this disturbance will only occur in a small area surrounding the drafting site and will only occur during a short period of time. When drafting stops the noise disturbance will cease, stream flow will be returned to pre-draft conditions, and no long-term effects will occur. Water temperature and other water quality elements will not be affected. Overall, any negative indirect effects to these species will be short-term and temporary.

Turbidity, a water quality component, is primarily expected to increase during in-channel activities associated with drafting from the NF Salmon River. If the two in-stream legacy sites undergo repair while their channels are wet, a sediment plume during would be expected, and for a short time afterwards as the sites settle. However, the legacy sites are expected to be fixed while the channel is dry, and such is not expected. There will be no effect to these species or their habitats with short term and localized increase of turbidity.

Temperature will be as described for steelhead/rainbow trout. There is the potential for frogs to be present in perennial/intermittent channels adjacent to and within Project units. However, as effective shade within the Project area will not be reduced by Project activities, any impacts to temperature will be insignificant and will not affect American dippers, long-tailed voles, western pond turtles, or northern water shrews.

Ground disturbing actions within the Project area have the potential mobilize fine sediment, thereby affecting bottom substrate composition, although it will not be sufficiently significant to alter existing habitat values. In general, substrate as described for steelhead/rainbow trout also applies to these species. The Hydrology Resource Report reported an expectation of low to moderate risk of sediment mobilization at the site level for all Project activities; no too low at the reach (300 feet from site) scale; and no risk when considered at the level of the 7th-field watershed (USFS 2013). Even if fine sediment is mobilized, the use of RMP or BMPs minimizes the amount such that substrate composition is not expected to

measurably change. Therefore, the risk associated with fine sediment to these four species and their habitat is expected to be insignificant.

The disturbance indices will be as described for steelhead/rainbow trout. The Project will experience no functional change in CWE models and therefore there will be no measurable effect to these four species or their habitat.

Alterations in peak/base flows will be as described for steelhead/rainbow trout. At the watershed-scale, changes to flows by Project activities will not occur. Drafting will occur at sites potentially occupied by frogs. Whereas changes in flows upon the NF Salmon River will not be measurably affected, the Lover's Canyon ups Gulch and Jones Gulch sites are located within small systems and drafting may result in localized decreases in flow downstream. However, BMPs guide drafting operations such the drafting rate should not exceed 50 percent of the surface flow and that drafting will cease once bypass flows drop below 10 gallons per minute. Frogs downstream of the Lover's Canyon ups/Jones sites may experience temporary decreases in flows while drafting is happening, but the channel will not go dry. When drafting stops, stream flow is returned to pre-draft conditions, so no long-term effects will occur to the American dipper, long-tailed vole, western pond turtle, or the northern water shrew.

Impacts to the Riparian Reserve will be as described for steelhead/rainbow trout. Resource protection measures will ensure Riparian Reserve character will not be detrimentally altered by silviculture, fuels, and hazard tree treatments. Water drafting may have insignificantly small localized effects due to brushing and access maintenance, but there will be no effect to the functional level of the Riparian Reserve.

Overall, there may some short-term, insignificant disturbance and habitat quality impacts, the long-term response of the drainages within the Project area is expected to benefit American dipper, northern water shrew, western pond turtle, and long-tailed vole.

Cumulative Effects - There will be no short- or long-term cumulative effects to American dipper, northern water shrew, western pond turtle, and long-tailed vole habitat or American dipper, northern water shrew, western pond turtle, or long-tailed vole populations.

Alternative 3

Direct and Indirect – Alternative 3 differs from the Alternative 2 in regards to magnitude of impact.

Direct and indirect effects from water drafting will remain the same as described in the Alternative 2 for American dipper, long-tailed vole, western pond turtle, and northern water shrew.

Restriction of Riparian Reserve actions to underburning and roadside fuels treatments results in the reduction in size or elimination of commercial harvest units. Because commercial harvest creates greater ground disturbance than other Project elements, post-Project changes in CWE models show a lesser increase than under the Alternative 2 scenario (for ERA only, with GEO or USLE risks remaining the same). It is doubtful the computer modeling will translate to real-world distinction between the two

alternatives because natural variation will overwhelm the small differences in post-Project CWE outputs. Regardless, there will be no significant effects to aquatic habitat because models either remain below the critical threshold or do not contribute to existing over-threshold risks. Any risk of overland transport of sediment to streams as a result of harvest will also be decreased because no-equipment/no-entry Riparian Reserve buffer for *all* commercial units will be 170 feet [50 meters]. Insignificant beneficial effects due to treatment of legacy sites and post-Project rehabilitation of temporary roads will remain as described for Alternative 2.

Cumulative – Cumulative effects for American dipper, long-tailed vole, western pond turtle, and northern water shrew will be the same as described under Alternative 2.

SNAG SPECIES ASSOCIATION

Red-breasted sapsuckers, hairy woodpeckers, downy woodpeckers, white-headed woodpeckers, Vaux's swifts, pileated woodpeckers, and black-backed woodpeckers were selected as indicators of snags as a habitat element within mature conifer and riparian deciduous habitats. Standards and Guidelines from the Forest Plan that are related to snag-dependent species, and that are being implemented as part of the Lover's Canyon Project, include retention of an average of five large snags per acre across the landscape (range in project area of two to five per acre) in a variety of size classes (greater than 50 percent over 20 inches in diameter at breast height). By implementation of Standards and Guidelines, at a minimum, the proposed project prescriptions maintain moderate capability snag habitat in the majority of timber harvest units and high capability habitat in untreated parts of the project area ("capability" as determined in the Forest Plan Environmental Impact Statement Appendix I, Wildlife Habitat Capability Model for Cavity Nesting and Decadence Wildlife Assemblage). In addition to Standards and Guidelines which provide protection for snags as a habitat component, riparian reserves have been established to protect and enhance conditions of late-successional forests. Riparian reserves are habitat "reserves" where populations of snag-dependent species will be largely unaffected by land management activities.

Red-breasted sapsucker

Environmental Baseline

The analysis area for snag-associated species in the Lover's Canyon Project is the same as the "project area" as described in the environmental assessment. The project area is large enough in size to potentially contain habitat for several red-breasted sapsucker territories. There are 11,069 acres of mid-seral and mature mixed conifer habitat, potentially suitable for sapsuckers, scattered throughout the project area on Forest Service and private land. Habitat in the project area is currently moderate capability for sapsuckers.

Red-breasted sapsuckers have not been documented in the project area, but it is assumed that they would occur there. Red-breasted sapsuckers are not considered a common species and little is known about local distribution and abundance. In Modoc County, California, home ranges have been reported up to 15 acres.

Effects of the Proposed Project

Alternative 1

There would be no change in the amount or quality of snag habitat in the project area; risk of stand replacing fire would remain moderate to high in the landscape.

Alternative 2

Four hundred and sixty four acres of potential habitat are located within treatment units. Proposed treatments will not affect the availability of large snags.

Proposed harvest and post-harvest activity fuels treatments should not affect suitable habitat for red-breasted sapsuckers. Large snags that could provide habitat components will not be removed. Harvest will remove some snag recruitment trees with in the acres of treatment. Forest Plan Standard and Guideline snag minimums will be maintained in these treated areas. Snag habitat should remain abundant and well distributed after treatments. Outside of treated areas snag habitat will remain abundant throughout the 7th field watersheds. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

All treated acres will remain at moderate capability after harvest. No habitat patches equal to the size of sapsucker home ranges (15 acres) will be removed through timber harvest.

Alternative 3

Four hundred and sixty four acres of potential habitat are located within treatment units. Proposed treatments will not affect the availability of large snags.

Proposed harvest and post-harvest activity fuels treatments should not affect suitable habitat for red-breasted sapsuckers. Large snags that could provide habitat components will not be removed. Harvest will remove some snag recruitment trees with in the acres of treatment. Forest Plan Standard and Guideline snag minimums will be maintained in these treated areas. Snag habitat should remain abundant and well distributed after treatments. Outside of treated areas snag habitat will remain abundant throughout the 7th field watersheds. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

All treated acres will remain at moderate capability after harvest. No habitat patches equal to the size of sapsucker home ranges (15 acres) will be removed through timber harvest.

Hairy Woodpecker and Downy Woodpecker

Environmental Baseline

The analysis area for snag-associated species in the Lover's Canyon Project is the same as the "project area". The project area is large enough in size to potentially contain habitat for several hairy or downy woodpecker territories. There are 7,348 acres of mature mixed conifer habitat within the analysis area.

Seven hundred and forty three acres occurs with proposed treatment areas. These two woodpecker species are associated with mature mixed conifer, but are more specifically linked with deciduous riparian habitats interspersed along streams within mixed conifer forest.

It is assumed that both hairy and downy woodpeckers occur throughout the project area. Both hairy and downy woodpeckers are considered common species, although little is known about local distribution and abundance. In Ontario, breeding territories for hairy woodpeckers ranged from six to eight acres and ranged from five to nine acres for downy woodpeckers.

Effects of the Proposed Project

Alternative 1

There would be no change in the amount or quality of snag habitat in the project area; risk of stand replacing fire would remain moderate to high in the landscape.

Alternative 2

Four hundred seventy nine acres of mature mixed conifer habitat in the project are located in proposed treatment units. Of the acreage potentially affected by proposed treatments, it is expected that hairy and downy woodpeckers would only be associated with a small percentage of the treatment units closest to riparian deciduous habitats. Implementation of Standards and Guidelines as described above, such as Riparian Reserves, will minimize potential impacts to habitat where woodpeckers are expected to occur by excluding those areas from treatment units. Large snags that could provide habitat components will not be removed.

Proposed harvest and post-harvest activity fuels treatments should not affect suitable habitat for these species. Large snags that could provide habitat components will not be removed. Harvest will remove some snag recruitment trees with in the acres of treatment. Forest Plan Standard and Guideline snag minimums will be maintained in these treated areas. Snag habitat should remain abundant and well distributed after treatments. Outside of treated areas snag habitat will remain abundant throughout the surrounding 7th field watersheds. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

Alternative 3

Four hundred seventy nine acres of mature mixed conifer habitat in the project are located in proposed treatment units. Of the acreage potentially affected by proposed treatments, it is expected that hairy and downy woodpeckers would only be associated with a small percentage of the treatment units closest to riparian deciduous habitats. Implementation of Standards and Guidelines as described above, such as Riparian Reserves, will minimize potential impacts to habitat where woodpeckers are expected to occur by excluding those areas from treatment units. Large snags that could provide habitat components will not be removed.

Proposed harvest and post-harvest activity fuels treatments should not affect suitable habitat for these species. Large snags that could provide habitat components will not be removed. Harvest will remove some snag recruitment trees with in the acres of treatment. Forest Plan Standard and Guideline snag minimums will be maintained in these treated areas. Snag habitat should remain abundant and well distributed after treatments. Outside of treated areas snag habitat will remain abundant throughout the surrounding 7th field watersheds. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

White-headed Woodpecker, Vaux's Swift, and Pileated Woodpecker

Environmental Baseline

The analysis area is large enough in size to potentially contain habitat for several white-headed woodpecker territories (average 15 acres in Blue Mountains) and enough habitats for up to one pileated woodpecker foraging areas (500-1,200 acres). Vaux's swift territories may be limited to individual trees. There are 12,637 acres of mature mixed conifer and true fir habitat, potentially suitable for swifts and woodpeckers, on Forest Service land. White-headed and pileated woodpeckers have been detected in the project area. Vaux's swifts are suspected to exist in the area. Little is known about local distribution and abundance of these species.

Effects of the Proposed Project

Alternative 1

There would be no change in the amount or quality of snag habitat in the project area; risk of stand replacing fire would remain moderate to high in the landscape.

Alternative 2

Four hundred seventy nine acres of potential habitat are located within treatment units. Proposed treatments will not affect the availability of large snags.

Proposed harvest and post-harvest activity fuels treatments are not predicted to affect suitable habitat for these species. Large snags that could provide habitat components will not be removed. Harvest will remove some snag recruitment trees with in the acres of treatment. Forest Plan Standard and Guideline snag minimums will be maintained in these treated areas. Snag habitat should remain abundant and well distributed after treatments. Outside of treated areas snag habitat will remain abundant throughout the surrounding 7th field watersheds. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

Black-backed Woodpeckers

Environmental Baseline

The analysis area contains approximately 5,289 acres of mature fir habitat. Although black-backed woodpeckers are associated with fir habitats, they are more commonly associated with fir and lodgepole pine at high elevations (greater than 6,000 feet) in the Cascade Mountains (eastside of the Klamath). Black-backed woodpeckers may be found in the project area.

Effects of the Proposed Project

Alternative 1

There would be no change in the amount or quality of snag habitat in the project area; risk of stand replacing fire would remain moderate to high in the landscape.

Alternative 2

Fifteen acres of mature fir habitat in the project area are located within treatment units. Large snags that could provide habitat components will not be removed.

Proposed harvest and post-harvest activity fuels treatments should not affect suitable habitat for black backed woodpeckers. Large snags that could provide habitat components will not be removed. Harvest will remove no acres of this habitat. Snag habitat should remain available on the 5,289 acres of mature fir habitat in the analysis area after treatments. Outside of treated areas, snag habitat will remain abundant throughout the surrounding 7th field watershed. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

Alternative 3

Fifteen acres of mature fir habitat in the project area are located within treatment units. Large snags that could provide habitat components will not be removed.

Proposed harvest and post-harvest activity fuels treatments should not affect suitable habitat for black-backed woodpeckers. Large snags that could provide habitat components will not be removed. Harvest will remove no acres of this habitat. Snag habitat should remain available on the 5,289 acres of mature fir habitat in the analysis area after treatments. Outside of treated areas snag habitat will remain abundant throughout the surrounding 7th field watershed. Some snags within units may be felled for safety reasons. Felling of individual snags will be scattered and infrequent and will not have a measurable effect on the amount of habitat in the project units.

MIS Habitat by MIS Species

MIS Species	MIS Habitat
Acorn Woodpecker	Oak
Western Gray Squirrel	Oak
Hairy Woodpecker	Mat MC, Mat dense MC
Downy Woodpecker	Mat MC, Mat dense MC
White headed Woodpecker	Mat F, Mat MC, and Mat dense MC
Vaux's Swift	Mat F, Mat MC, and Mat dense MC
Pileated Woodpecker	Mat F, Mat MC, and Mat dense MC
Red breasted Sapsucker Mat	MC, Mat dense MC, and mid seral
Black backed woodpecker	Mat F

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